

**SPECIAL ISSUE
ON LINEAR ALGEBRA AND STATISTICS**

**Special Editors: Michael D. Perlman, Friedrich Pukelsheim, and
George P. H. Styan**

PREFACE	1
R. B. BAPAT (New Delhi, India) Permanents in Probability and Statistics	3
R. DAHLHAUS (Heidelberg, West Germany) Approximations for the Inverse of Toeplitz Matrices with Applications to Stationary Processes	27
G. TSAKLIDIS AND P.-C. G. VASSILIOU (Thessaloniki, Greece) Infinite Products of Matrices with Some Negative Elements and Row Sums Equal to One	41
OLAF KRAFFT AND MARTIN SCHAEFER (Technical University, Aachen, West Germany) Convergence of the Powers of a Circulant Stochastic Matrix	59
JEFFREY J. HUNTER (Auckland, New Zealand) Parametric Forms for Generalized Inverses of Markovian Kernels and Their Applications	71
NANCY FLOURNOY (Washington, D.C.) Dependency in Multivariate Markov Chains	85
A. G. M. STEERNEMAN (Groningen, The Netherlands) G-Majorization, Group Induced Cone Orderings, and Reflection Groups	107
A. M. DEAN AND J. S. VERDUCCI (Columbus, Ohio) Linear Transformations That Preserve Majorization, Schur Concavity, and Exchangeability	121
ALESSANDRA GIOVAGNOLI (Perugia, Italy) AND MARIO ROMANAZZI (Venice, Italy) A Group Majorization Ordering for Correlation Matrices	139
JERZY K. BAKSALARY (Zielona Góra, Poland) AND JAN HAUKE (Poznań, Poland) A Further Algebraic Version of Cochran's Theorem and Matrix Partial Orderings	157

Table of Contents continued

JERZY K. BAKSALARY (Zielona Góra, Poland), KENNETH NORDSTRÖM (Helsinki, Finland), AND GEORGE P. H. STYAN (MONTRÉAL, QUÉBEC) Löwner-Ordering Antitonicity of Generalized Inverses of Hermitian Matrices	171
R. A. BAILEY (Harpenden, U.K.) AND C. A. ROWLEY (Milton Keynes, U.K.) General Balance and Treatment Permutations	183
ANDRÉ KOBILINSKY (Versailles, France) Complex Linear Models and Cyclic Designs	227
J. N. SRIVASTAVA AND DIANE THROOP (Fort Collins, Colorado) Orthogonal Arrays Obtainable as Solutions to Linear Equations over Finite Fields	283
J. LAUTERBACH (Hannover, West Germany) AND P. STAHLCKER (Mainz, West Germany) Some Properties of $[\text{tr}(Q^{2p})]^{1/2p}$ with Application to Linear Minimax Estimation	301
DOUGLAS P. WIENS (Edmonton, Canada) Robust Minimax Designs for Multiple Linear Regression	327
KENNETH NORDSTRÖM (Helsinki, Finland) AND JOHAN FELLMAN (Helsinki, Finland) Characterizations and Dispersion-Matrix Robustness of Efficiently Estimable Parametric Functionals in Linear Models with Nuisance Parameters	341
JERZY K. BAKSALARY (Zielona Góra, Poland) AND SIMO PUNTANEN (Tampere, Finland) Characterizations of the Best Linear Unbiased Estimator in the General Gauss-Markov Model with the Use of Matrix Partial Orderings	363
JERZY K. BAKSALARY AND PAWEŁ R. PORDZIK (Poznań, Poland) A Note on Comparing the Unrestricted and Restricted Least-Squares Estimators	371
HANS JOACHIM WERNER (Bonn, West Germany) On Inequality Constrained Generalized Least-Squares Estimation	379
JERZY K. BAKSALARY (Zielona Góra, Poland) AND THOMAS MATHEW (Baltimore, Maryland) Rank Invariance Criterion and Its Application to the Unified Theory of Least Squares	393

Table of Contents continued

DOUGLAS M. HAWKINS (St. Paul, Minnesota) AND DAN BRADU (Pretoria, South Africa) Application of the Moore-Penrose Inverse of a Data Matrix in Multiple Regression	403
A. J. SCOTT (Auckland, New Zealand), J. N. K. RAO (Ottawa, Canada) AND D. ROLAND THOMAS (Ottawa, Canada) Weighted Least-Squared and Quasilikelihood Estimation for Categorical Data under Singular Models	427
F. R. DE HOOG (Canberra, Australia), T. P. SPEED (Berkeley, CA), AND E. R. WILLIAMS (Canberra, Australia) On a Matrix Identity Associated with Generalized Least Squares	449
DIETRICH VON ROSEN (Stockholm, Sweden) A Matrix Formula for Testing Linear Hypotheses in Linear Models	457
J. H. RANDALL (Stellenbosch, South Africa) AND A. A. RAYNER (Pietermaritzburg, South Africa) The Accuracy of Least Squares Calculations with the Cholesky Algorithm	463
CHING-SHUI CHENG (Berkeley, California) AND KER-CHAU LI (Los Angeles, California) Characterization of Invariant Spaces under a Symmetric Real Matrix and Its Permutations	503
CHI SONG WONG (Windsor, Canada) Extensions of $\text{tr}[(A^{-1} - B^{-1})(A - B)] \leq 0$ for Covariance Matrices A, B	517
YASUO AMEMIYA (Ames, Iowa) On the Convergence of the Ordered Roots of a Sequence of Determinantal Equations	531
HAROLD V. HENDERSON (Hamilton, New Zealand) and Shayle R. Searle (Ithaca, New York) Generalized Dispersion Matrices for Covariance Structural Analysis	543
A. SHAPIRO AND M. W. BROWNE (Pretoria, South Africa) On the Treatment of Correlation Structures as Covariance Structures	567

Table of Contents continued

H. NEUDECKER (Amsterdam, The Netherlands) AND A. M. WESSELMAN (Utrecht, The Netherlands) The Asymptotic Variance Matrix of the Sample Correlation Matrix	589
MARA LEE McLAREN (Ottawa, Canada) Asymptotic Results for Decomposing a Likelihood-Ratio Statistic into Separate Components	601
H. NANDA (NIE, INDIA) AND I. OLKIN (Stanford, California) Matrix Properties of an Interbattery Factor Analytic Model	617
TOM WANSBEEK AND JAAP VERHEES (Groningen, The Netherlands) The Algebra of Multimode Factor Analysis	631
U. KAMPS (AACHEN, WEST GERMANY) Relative Efficiency of Estimates and the Use of Chebyshev Polynomials in a Model of Pairwise Overlapping Samples	641
AUTHOR INDEX	655



